

# **NSERC / FFAW Project: Sustainable Fisheries**

## **Lobsters in Western Newfoundland: Reproductive Relative to Economic Value**

### **Community Consultation and Follow-up**

**Plum Point at the Plum Point Motel, 6 April 2011  
Cow Head at the Shallow Bay Motel, 7 April 2011  
Stephenville at the Holiday Inn, 8 April 2011**

## **Visual presentations at Cow Head and Stephenville**

- CURRA context**
- Participants/Organizations – Investigators**
- Participants/Organizations – Advisory**
- Results of NSERC/FFAW research to date**
  - Conservation measures**
    - Closed areas**
    - V-notching**
    - Slot Fishery**
  - Current issues, addressed at consultations**

**Summary of current issues, slot fishery**

**Follow-up, 10 April 2011, based on consultations**



## Community - University Research for Recovery Alliance

About Us

Collaborative Research

Events & News

Success Stories

Publications & Reports

► Overview

► Globalization & Recovery

► Rural Youth & Recovery

► Fishplants - Past & Future

► Critical Habitat

► Governing for the Future

► New Initiatives

► Curriculum for Recovery

► Promoting Dialogue

### Collaborative Research — an Overview

Researchers at Sir Wilfred Grenfell College and Memorial University along with multiple community partners have received funding for a Community-University Research for Recovery Alliance focusing on Newfoundland's west coast marine ecosystems and fishing communities. Our activities will include:

- Broadening use and public engagement with the Bonne Bay Marine Station
- Linking research and local knowledge to develop key recovery strategies for the region
- Enhancing the capacity of fish harvesters and fishing communities within the region to engage in recovery strategies
- Integrating existing knowledge and developing new knowledge about fish, fisheries and fishing communities
- Transferring knowledge to the region and between generations through innovative community-based educational programs and initiatives
- Create a multi-disciplinary platform for future research and collaborations



SSHRC

Social Sciences and  
Humanities Research Council  
(SSHRC)



Memorial University



## Participants/Organizations – Investigators

- David Schneider – Ocean Sciences Centre, MUN
  - Barbara Neis – Department of Sociology, MUN
  - Kate Wilke – Ocean Science Centre, MUN
  - Cailin Xu – Ocean Sciences Centre MUN
  - MUN Students: Kathy Whiffen, Jens Currie, Jamie Raper
  - Jason Spingle (FFAW)
  - Monty Way (FFAW)
- And of course....



## **Participants/Organizations - Advisory**

### **NSERC Advisory Committee**

- **Lew Incze (University of Southern Maine)**
- **Bob Steneck (University of Maine)**
- **Rick Wahle (Bigelow Lab, Boothbay Harbor, Maine)**

### **Industry**

- **Harvey Jarvis (FFAW)**

### **Department of Fisheries and Oceans, St. John's, NL**

- **Roanne Collins (Science Branch)**

### **Informal**

- **Jerry Ennis (DFO Science, retired)**
- **Bob Hooper (MUN)**



## **NSERC / FFAW Project: Sustainable Fisheries**

- **Lobsters in Western Newfoundland:**
- **Reproductive Relative to Economic Value**

### **Background**

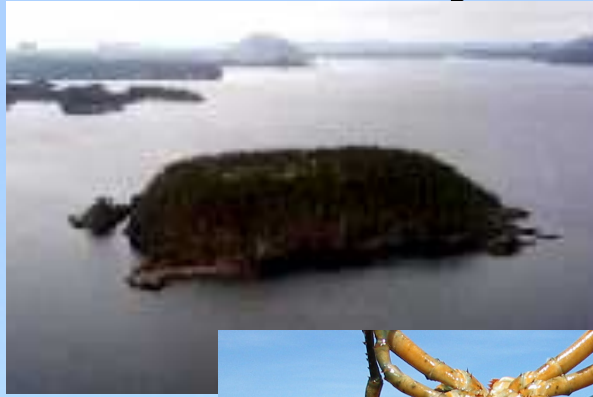
- **\$550 million/year in landed value, export market**
- **Value of regular income to rural communities**





# Conservation measures – Do they matter?

- Closed areas



- V-notching



- Slot Fishery



# Do these measures matter?

## •Reproductive / Economic Value

SEARCH  GO

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- Chowder & Bisques
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- Lobster Tails
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[Home](#) > [Live Lobster](#) > [Jumbo Live Lobsters \(4 - 10 pounds\)](#)



**Jumbo Live Lobsters (4 - 10 pounds)**

We keep these massive live lobsters in darkened seawater tanks. The water is kept chilled at a constant 38 degrees so as to simulate their natural environment. This process keeps the lobsters strong and healthy. These are hard shelled lobsters and full of meat.

	<a href="#">Four Pound Jumbo Lobster</a> <b>\$67.34</b>
	<a href="#">Eight Pound Jumbo Lobster</a> <b>\$134.68</b>
	<a href="#">Nine Pound Jumbo Lobster</a> <b>\$151.52</b>

What is a lobster worth to the person who catches it?  
What is that lobster worth to the lobster population?



# Reproductive / Economic Value

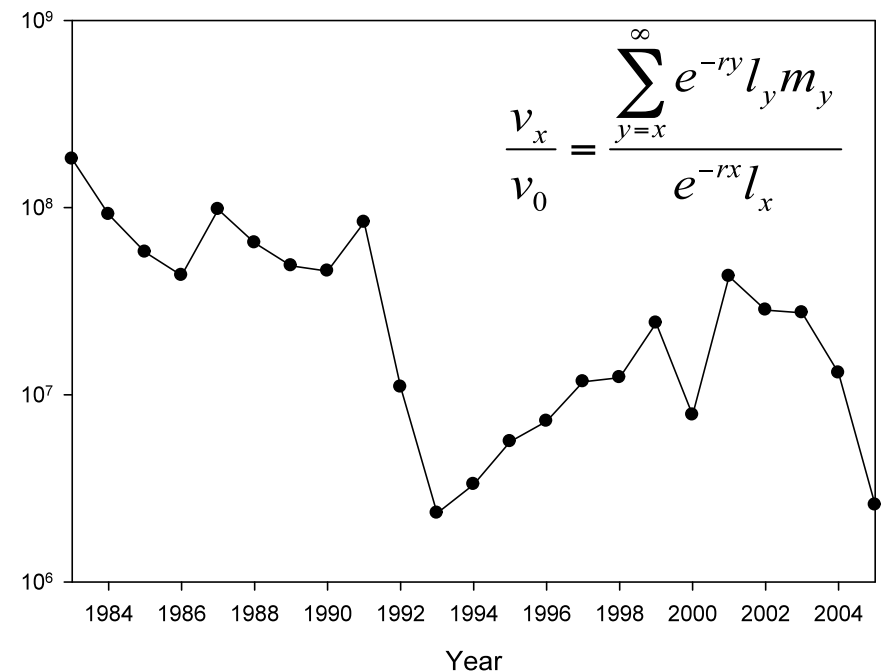
Fecundity by itself a misleading  
measure in long lived species  
as it discounts future egg production  
if the measure is fecundity at age  
rather than lifetime fecundity

Walters and Martell 2004  
*Fisheries Ecology and Management*  
Princeton University Press

It's like dividends and interest. What  
are future dividends worth on a 7 year  
certificate of deposit at the bank?

[7 years from egg to legal size]

## Why use reproductive value?



# Evaluation of conservation measures

- Closed areas



$$\frac{v_x}{v_0}$$

Closed area compared to adjacent area

- V-notching



$$\frac{v_x}{v_0}$$

With and without v-notching, depending on % notched

- Slot Fishery

$$\frac{v_x}{v_0}$$

As it depends on the upper limit of the slot





# Evaluation of conservation measures - Results

## •Closed areas



$\frac{v_x}{v_0}$  33% increase  
in current and  
future egg  
production

## •V-notching



$\frac{v_x}{v_0}$  20% increase  
in current and  
future egg  
production

## •Slot Fishery

$\frac{v_x}{v_0}$  30% increase in  
current and future egg  
production





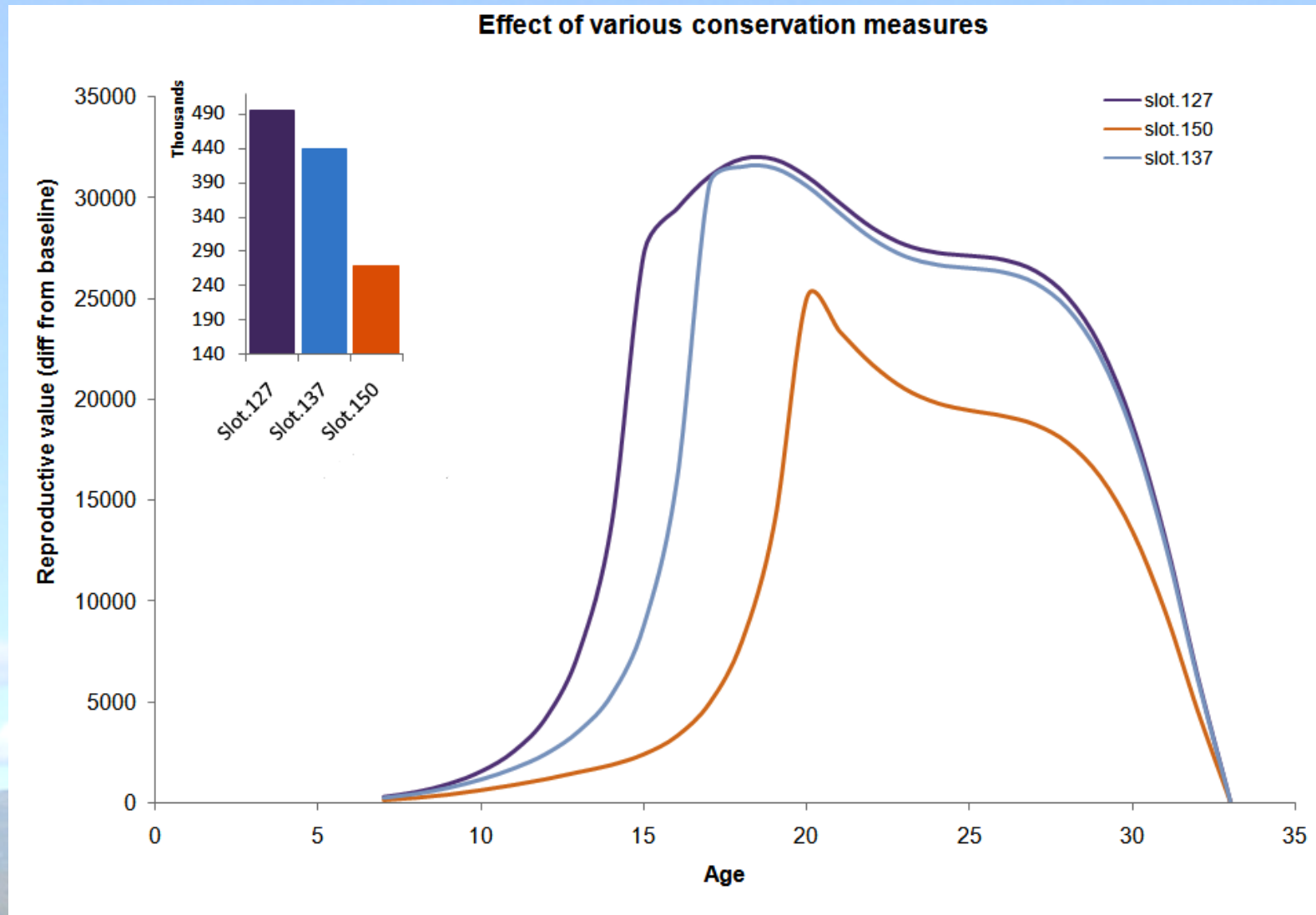
## **Questions arising.**

- **What if we change the upper limit on slot?**
- **Does window fishery work? Compared to slot**
- **Does % females with eggs depend on size?**
- **Does heavier fishing on males affect egg number?**
- **Does catch decrease due to more jumbos?**



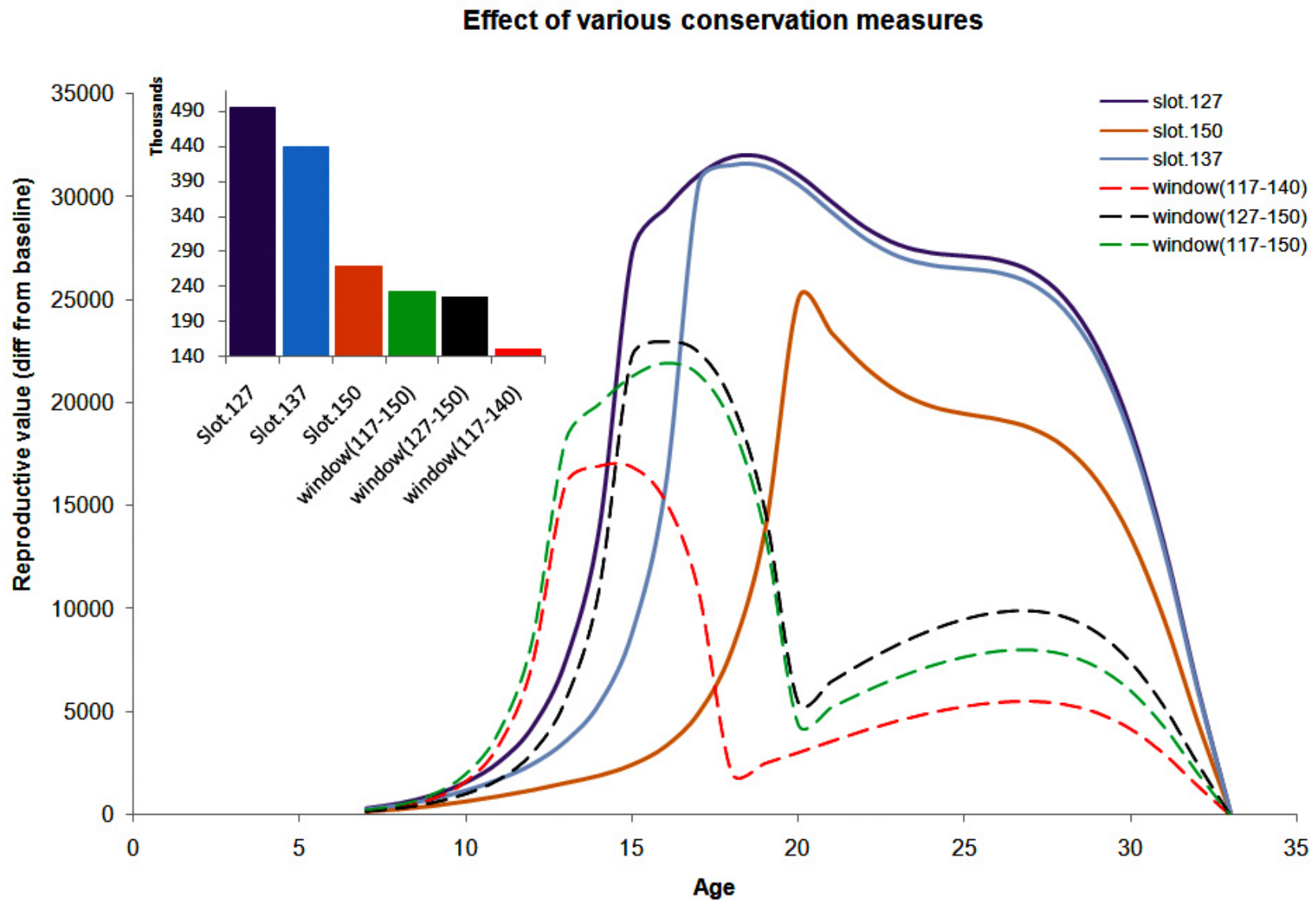
## Current issues:

- What if we change the upper limit on slot?



## Current issues:

- Does window fishery work? Compared to slot





**Discussion at all three consultations was lively and informative.**



## **Summary, based on all three consultations.**

- **What if we change the upper limit on slot?**
  - **Substantial reduction in effect if slot to 150 mm**
- **Does window fishery work?**
  - **Eliminates jumbos in fishable areas**
  - **Substantial reduction in effect, similar to 150 mm slot**
- **Does % females with eggs depend on size?**
  - **Preliminary results**
    - **Percent with eggs about 40%, regardless of size**
    - **Small sample size, needs better estimate**
- **Does heavier fishing on males affect egg number?**
  - **Yes, if jumbo males needed to fertilize jumbo females**
- **Does catch decrease due to more jumbos? [Next]**



**Summary, based on all three consultations.**

**Does catch decrease due to more jumbos?**

- **We can look at catch but we cannot expect solid science answer on effects of jumbos on catch:**
  - **Catch due to many factors, including effort**
  - **Catch is variable, obscuring effects**
  - **Lag from egg to legal size is 5-7 years**
- **Free-ranging lobsters in large tanks tell us:**
  - **No destruction of small lobsters, if shelter**
  - **Destruction of molting lobsters, despite shelter**





## **Summary – Slot fishery**

### **Advantages of slot fishery:**

- **Increased egg production [30%]**
- **Large males present for fertilization [Yes]**
- **Egg production by stable numbers of females [Yes]**

### **Disadvantages of slot fishery**

- **Destruction of small lobsters in traps [Yes]**
- **Destruction of small lobsters outside traps [No?]**
- **Effects of increased jumbos on catch [unknown]**

### **Adaptive management**

- **Mitigate – move jumbos to non fishable areas**
- **Replace – increase v-notching**
- **Closures – safe areas for jumbos, within LFA**
- **Others ?**

